

Amendment and Response Under 37 C.F.R. 1.116

Applicant: Craig K. Carlson-Stevermer

Serial No.: 10/622,849

Filed: July 18, 2003

Docket No.: A126.114.102

Title: WAFER STAGING PLATFORM

REMARKS

The following remarks are made in response to the Final Office Action mailed February 14, 2006. In the Final Office Action, the Abstract, Title, and the Drawings were objected to. Claim 24 was objected to due to a minor informality.

In addition, claims 16-21, 23, and 24 were rejected under 35 U.S.C. §102(b) as being anticipated by the admitted prior art of FIGS. 1-13. Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of FIGS. 1-13 in view of Akaike et al., U.S. Patent No. 6,317,647 ("Akaike"). Claims 5-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of FIGS. 1-13 in view of Sommer, U.S. Patent No. 6,562,184 ("Sommer"). Claims 11-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of FIGS. 1-13 in view of Sommer as applied to claims 5-10 above, and further in view of Smith et al., U.S. Patent No. 6,503,043 ("Smith").

With this Response, claims 23 and 24 have been amended. Claims 1, 5-14, and 16-24 remain pending in the application and are presented for consideration and allowance.

Objection to the Abstract

The Abstract was objected to for not being within the range of 50 to 150 words. The Examiner required correction and cited to MPEP §608.01(b).

With this Response, Applicant respectfully submits a rewritten Abstract of 50 - 150 words that is believed to conform to the Patent Rules and the Examiner's requirement. It is respectfully requested that the Amendment to the Abstract be entered, and the objection to the Abstract be withdrawn.

Objection to the Title

The Title was objected to as not being descriptive. The Examiner required a new Title that is clearly indicative of the invention to which the claims are directed.

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With this Response, a more descriptive, rewritten Title is submitted for the Examiner's approval. It is believed that the rewritten Title is descriptive of the invention as claimed. It is respectfully requested that the rewritten Title be accepted by the Examiner, and the objection to the Title be withdrawn.

Objection to the Drawings

The drawings were objected to under 37 C.F.R. §1.83(a). The Examiner takes the position that a wafer staging platform having at least two platforms (Claim 9) and two platforms aligned in a vertical stack (Claim 22) must be shown or the features cancelled from the claims.

Corrected drawings in compliance with 37 C.F.R. §1.121(d) were submitted on November 30, 2005. In the corrected drawings submitted November 30, 2005, Figures 14 and 15 were amended to identify features of the invention specified in the claims. In this regard, Figure 14 illustrates a top view of a wafer staging platform, and Figure 15 illustrates a side view of the wafer staging platform of Figure 14. It is believed that Figure 15 illustrates a wafer staging platform having two platforms, where the platforms are aligned in a vertical stack. It is believed that all claimed features of the pending invention are illustrated in Figures 14-28. It is respectfully requested that the objections to the drawings be withdrawn, and the drawings filed on November 30, 2005 be accepted.

Objection to the Claims

Claim 24 was objected to as having an informality related to antecedent basis. With this Response, claim 24 has been amended to more perfectly recite antecedent basis relative to claim 23. In particular, "a sample holder" has been amended to recite "the sample holder." It is respectfully requested that the objection to claim 24 be withdrawn.

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In addition, although not objected to, it has recently been discovered that claim 23 does not conclude with a period. With this Response, claim 23 has been amended to include a period, thus correcting this minor informality unrelated to patentability.

It is respectfully requested that the amendments to claims 23 and 24 that correct minor informalities be entered.

35 U.S.C. §102 Rejections

Claims 16-21 and 23-24 were rejected under 35 U.S.C. §102(b) as being anticipated by the admitted prior art of Figures 1-13.

With regard to independent claim 23, the Examiner takes the position that the admitted prior art of Figures 1-13 teaches staging (via robot 10) a first sample on a sample holder, where the sample holder is load port 2, and returning (via robot 10) the first sample to a sample load port, this being load port 1. Applicant respectfully disagrees.

The admitted prior art of Figures 1-13 teaches the sequential processing of a wafer between a processing platform and eventual storage in a load port. Figures 2-6 illustrate the movement of a processed wafer 20 from a processing platform 16 to storage in load port 12 labeled as "Loadport1". Figures 7-13 illustrate a second wafer 22 subsequently moved from a pre-aligner 14 to the processing platform 16 after the wafer 20 has been placed in the load port 12. The admitted prior art of Figures 1-13 does not teach or suggest staging the first sample on a sample holder, and returning the first sample to the sample load port, as required by independent claim 23.

The Examiner interprets load port 2 of the admitted prior art of Figures 1-13 to be a sample holder on which first sample or wafer 20 is staged. Regardless of this unsupported interpretation, nothing in the admitted prior art teaches or suggests that either of the wafers 20 or 22 are initially in one of the two loadports 12, processed, moved to the second of the two loadports 12, and then returned to the original loadport 12 from which the wafer was initially presented. Stated otherwise, the Examiner's

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asserted interpretation of the admitted prior art requires that the wafer 20 (or 22) initially be located in the first loadport ("Loadport 1"), transferred to the processing platform 16 for processing, then transferred to the second loadport ("Loadport 2"), and then transferred to the first loadport (Loadport 1). This is simply not true, is no way described in the admitted prior art. To the contrary, the admitted prior art describes that starting with FIG. 2, the first wafer 20 is being processed on the processing platform 16, while the second wafer 22 is located on the pre-aligner 14. Subsequently, the first wafer 20 is transferred to the first loadport ("Loadport 1"). From this point, the admitted prior art makes no mention of further movement of the first wafer 20. Nowhere does the admitted prior art even suggest that the first wafer 20 is ever moved to or from the second loadport ("Loadport 2"), let alone teach, as asserted by the Examiner, that the first wafer or sample is moved to the second loadport ("Loadport 2") to the first loadport ("Loadport 1"). With respect to the second wafer 22, the admitted prior art makes no mention of which of the two loadports 12 the second wafer 22 was initially provided in, nor where the second wafer 22 is delivered following processing by the processing platform 16. To the contrary, there is nothing in the admitted prior art that teaches or suggests that either wafer 20, 22 goes back and forth between the two loadports 12; such a scenario would make no sense.

In addition, one of skill in the art would recognize that a load port is used to store wafers before and after processing, as described in the instant specification in the Background at page 2, lines 16-18. Thus, placing a sample in a load port is distinct from staging a sample on a sample holder, as required by claim 23. Moreover, once a sample reaches the load port (interpreted by the Examiner to be a sample holder), it would be nonsensical to then "return the first sample to the sample loadport," as also required by claim 23.

Based upon the above, it is respectfully submitted that independent claim 23 recites patentable subject matter over the admitted prior art of Figures 1-13. Further, with a correct understanding of what the admitted prior art teaches, claims 16-21 and

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24 further define patentably distinct subject matter. It is respectfully requested that the rejections to claims 16-21 and 23-24 under 35 U.S.C. §102(b) as being anticipated by the admitted prior art of Figures 1-13 be withdrawn.

35 U.S.C. §103 Rejections

Claim 1 was rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of Figures 1-13 in view of Akaike. The Examiner takes the position that the admitted prior art of Figures 1-13 teaches a first platform in the form of load port 1, and a second platform in the form of load port 2. Contrary to the Examiner's unsupported statement, nothing in the admitted prior art teaches or suggests that the first and second load port 1, 2 platforms are "aligned" as otherwise required by claim 1. For this reason alone, the rejection of claim 1 is traversed.

In addition, the Examiner concedes that the admitted prior art does not disclose that the platforms are vacuum-assisted. However, the Examiner notes that Akaike teaches that the addition of vacuum exhaust lines to a platform is advantageous because it helps maintain the connection between the platform and the wafer under test. The Examiner concludes that it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the apparatus of the admitted prior art by adding the vacuum exhaust lines as taught by Akaike in order to maintain the connection between the platform and the wafer under test during testing. Applicant respectfully disagrees.

To establish a *prima facie* case of obviousness, three basis criteria must be met. First, there must be some suggestion or motivation to modify or combine the reference teachings. Second, there must exist a reasonable expectation of success. Third, the references must teach or suggest all of the claim limitations. MPEP §2143.

No suggestion or motivation exists to combine the reference teachings. One of ordinary skill in the art would recognize that a load port is used to store multiple wafers before and after processing. The Examiner takes the position that the admitted prior art

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of Figures 1-13 teach a first platform in the form of load port 1, and a second platform in the form of load port 2, and that Akaike teaches that vacuum assistance is advantageous because it helps maintain the connection between the platform and the wafer under test during testing. However, providing vacuum assistance to a load port is contradictory to the teaching of Akaike, because vacuum assistance in a load port provides no advantage for wafers under test. Since modifying the load port to include vacuum assistance would have absolutely no effect on maintaining a connection between the platform and the wafer under test during testing, an Akaike advantage, it is respectfully submitted that there is no motivation to combine the admitted prior art of Figures 1-13 with the teaching of Akaike.

In addition, the admitted prior art of Figures 1-13 illustrate a first load port opposite a pre-aligner, and a second load port opposite a wafer processing platform. Even if the admitted prior art of Figures 1-13 were impermissibly combined with the teaching of Akaike, it is respectfully submitted that the resulting system would fail to teach or suggest first and second platforms in close proximity to a processing platform, as required by independent claim 1. Note, for example, that the load port opposite the wafer processing platform 16 in the admitted prior art is geographically located at the farthest point away from the processing platform for the entire environment illustrated in Figures 1-13.

Moreover, it is respectfully submitted that modifying the load ports of the admitted prior art, interpreted by the Examiner to be first and second platforms for holding a wafer, to include the vacuum assistance of Akaike would change the principal of operation of load ports that store cassettes of wafers pre-and post processing. That is to say, the cassette inside the load port maintains the wafer in the stored position, such that a vacuum-assisted load port would be a fundamentally different device. In fact, there is no need for vacuum assistance with a load port assembly, as the wafers are already stored in a cassette, such that any vacuum provided with the load port would never interact with the wafer. In this regard, if the proposed modification of the prior art

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would change the principal of operation of the prior art being modified (load ports), then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959). MPEP §21.43.01.

Thus, it is respectfully submitted that there is no suggestion or motivation to combine the reference teachings, and even if the reference teachings are impermissibly combined, the resulting system does not teach or suggest the limitations required by independent claim 1. For all these reasons, it is respectfully requested that the rejection to claim 1 under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of Figures 1-13 in view of Akaike be withdrawn.

Claims 5-10 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of Figures 1-13 in view of Sommer. The Examiner concedes at page 7 of the Final Office Action mailed February 14, 2006 that the admitted prior art of Figures 1-13 does not disclose a wafer staging platform as claimed. In addition, the Examiner concedes at page 7 that neither the admitted prior art nor Sommer discloses a staging platform disposed closer to the processing platform as claimed. However, the Examiner takes the position that it is well known to arrange elements to make them closer together where needed, and cites to MPEP §2144.04, and *In re Japikse*. The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to arrange the staging platform closer to the processing platform. Applicant respectfully disagrees.

In re Japikse stands for the proposition that rearranging parts in a device is not patentable (i.e., it would be obvious) where changing of the position of the parts would not modify the operation of the device. *In re Japikse*, 181 F.2d 1019, 86 U.S.P.Q. 70 (CCPA 1950); MPEP §2144.04 VI.C. (Emphasis added). That is to say, if moving the parts around doesn't make a difference, then it is a simple matter of design choice where to place the parts in the first place.

However, it is respectfully submitted that modifying the cited references to include a wafer staging platform disposed closer to a wafer processing platform than

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any of the wafer load ports would modify the operation of the system, and this modification would not be obvious to one of ordinary skill in the art as it produces new or unexpected results. Support for this assertion can be located in the specification of the pending invention at page 4, line 29 through page 5, line 2 where it is disclosed that providing the ability to stage wafers in close proximity to a processing platform reduces transfer time by as much as 80% compared to the system shown and described in the admitted prior art of Figures 1-13. Consequently Independent claim 5 provides a non-obvious, and patentably distinct difference over the admitted prior art and Sommer.

In addition, the prior art must provide a motivation or reason for the worker in the art, without the benefit of applicant's specification, to make the necessary changes in the referenced device. *Ex parte Chicago Rawhide Mfg. Co.*, 223 U.S.P.Q. 351, 353 (BD. Pat. App. & Inter. 1984). MPEP §2144.04 VI.C. The cited references provide no such motivation or reason for the worker in the art to modify the admitted prior art of Figures 1-13. In fact, it is respectfully submitted that Sommer teaches away from the purported modification.

Sommer teaches at column 3, lines 22-35 a chemical mechanical planarization system 100 that includes a factory interface 101, one or more polishing modules 106, and a wafer transfer corridor 104. The Examiner interprets at page 7 of the Final Office Action mailed February 14, 2006 that the wafer processing platform is analogous to the factory interface 101. Sommer teaches at column 6, lines 58-67 that the wafer transfer corridor 104 is generally positioned between the factory interface 101 and the polishing modules 106. A robot 10 is disposed in an enclosure 14, and the enclosure 14 has a load port 116, a second load port 118, and a third load port 120. Since Sommer teaches that the wafer transfer corridor 104 is positioned between the factory interface 101 and the polishing modules 106, Sommer teaches away from the requirement of independent claim 5 that a wafer staging platform be disposed closer to the wafer processing platform than any of the wafer load ports.

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With regard to claim 10, the Examiner takes the position that Sommer discloses a wafer staging platform 128 that includes a vacuum system 216. Applicant respectfully disagrees.

Sommer teaches at column 4, lines 3-18 that transfer robot 110 includes a first arm 202 having a distal end 214 and a second arm 210 coupled to the distal end 214 of the first arm 202. A vacuum blade 216 is coupled to a distal end 218 of the second arm 210. Sommer teaches that the vacuum blade 216 provides a gripping means for securing the wafer such that the wafer can be oriented feature side down for processing. In this regard, the robot arm in Sommer includes vacuum assistance. In contrast, dependent claim 10 requires the wafer staging platform to include a vacuum system for holding at least one wafer in place on the wafer staging platform.

It is respectfully submitted that a *prima facie* case of obviousness cannot be established based upon the admitted prior art of Figures 1-13 in view of Sommer. It is respectfully submitted that no motivation or suggestion to combine the cited references exists, as modifying the references to provide a wafer staging platform disposed closer to a wafer processing platform than any of the wafer load ports would change the operation of the devices in the prior art. In fact, Sommer teaches away from this limitation at column 6, lines 58-67. In addition, the purported combination fails to teach or suggest all of the limitations of the rejected claims. Consequently, it is respectfully requested that the rejections to claims 5-10 under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of Figures 1-13 in view of Sommer be withdrawn.

Claims 11-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over the admitted prior art of Figures 1-13 in view of Sommer as applied to Claims 5-10 above, and further in view of Smith.

Claims 11-14 depend directly, or indirectly, from independent claim 5. With regard to independent claim 5, the Examiner concedes at page 7 of the Final Office Action mailed February 14, 2006 that neither the admitted prior art nor Sommer

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discloses a staging platform disposed closer to the processing platform as claimed. As set forth above, it is believed that a *prima facie* case of obviousness cannot be established based upon the admitted prior art of Figures 1-13 in view of Sommer as applied to Claims 5-10 above. Consequently, since independent claim 5 is believed to non-obvious under 35 U.S.C. §103, then dependent claims 11-14 must also therefore non-obvious. MPEP §2143.03.

CONCLUSION

In view of the above, Applicant respectfully submits that pending claims 1, 5-14, and 16-24 recite patentable subject matter, are in form for allowance, and are not taught or suggested by the cited references. Therefore, reconsideration and withdrawal of the rejections and allowance of claims 1, 5-14, and 16-24 is respectfully requested.

No fees are required under 37 C.F.R. 1.16(h),(i). However, if such fees are required, the Patent Office is hereby authorized to charge Deposit Account No. 50-0471.

The Examiner is invited to telephone the Applicant's representative at the below-listed number to facilitate prosecution of this application.

Any inquiry regarding this Amendment and Response should be directed Timothy A. Czaja at Telephone No. (612) 573-2004, Facsimile No. (612) 573-2005. In addition, all correspondence should continue to be directed to the following address:

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Respectfully submitted,

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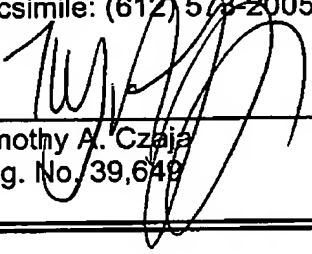
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Timothy A. Czaja
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The undersigned hereby certifies that this paper or papers, as described herein, are being transmitted via telefacsimile to Examiner Hollington of Group Art Unit 2828, Fax No. (571) 273-8800 on this 13th day of April, 2006.

By: 

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